



# M-LOK®

## Clamp Connector



Metalok360™ is a Canadian-owned and operated OEM of M-LOK® clamp connectors.

Tested and Proven all M-LOK® clamp connectors are compliant with the following and are fully interchangeable with other well-known brands available in the market.



ASME VIII-div.2 – appendix 4



Metalok360™ implements, for all its design, production and marketing cycles, procedures and is compliant with the requirements of the international ISO standard.

The quality assurance system for the manufacture of pressure vessels is compliant with the requirements of the European Directive 2014/68

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## M-LOK® Connection System

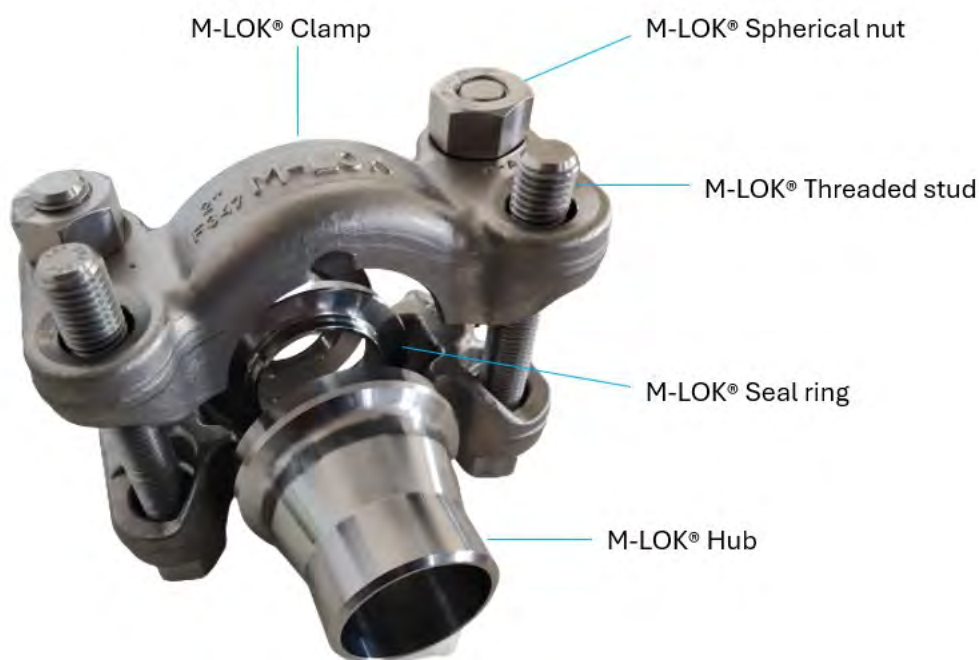


M-LOK® clamp connectors are ideally used in High Pressure and High Temperature flowline systems and offer considerable advantages as opposed to conventional flanges. They save size, weight, allow 360° orientation and minimize rig-up installation and maintenance downtime.

Pressure energized metal-to-metal sealing provides leak free connections with a lower bolt torque, and no elastomeric seals.

The M-LOK® clamp connectors are designed for Sour Gas service and severe environments.

All M-LOK® clamp connectors are compliant with ASME VIII-div.2 –appendix 4, PED 2014/68/EU and NACE MR01-75 standard and are fully interchangeable with other well-known brands available on the market.



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## M-LOK® Connection Systems



The Metalok360™ M-LOK® clamp connector is an equal alternative to or other clamp connector manufacturers' products.

The Metalok360™ M-LOK® clamp connector is designed to offer the strength and sealing technology of a welded joint and versatility of a mechanical joint. It serves the same purpose as a bolted flange assembly, with added advantages of being more easily installed (only 4 bolts) and up to 75 percent lighter and smaller by comparison to ANSI or ASME flanges.

The connector consists of 2 hubs, 1 seal ring, 1 clamp set with 4 bolts and 8 spherical nuts.

All materials available



## Connection Systems

Metalok360™ connection systems provide solutions to chronic problems associated with standard ANSI and ASME flange connections.

### Leak-Free Reliability

Our reusable metal-to-metal seal ring offers leak-free with zero leakage reliability over traditional ANSI and ASME gaskets.

### Weight Savings

With weight savings of up to 75% in comparison to ANSI flanges, our connection systems can typically save up to 1 million lbs. of weight on an offshore floating platform.

### Space Savings

Space savings of up to 50% with smaller O.D. and length dimensions compared to ANSI and ASME flanges. Pipe runs are closer together for more room for process equipment and future tie-backs. Ideal for small O.D. pull-in-head requirements.

### External Loads

Our connectors are able to handle high fatigue and high bending moments. We can optimize the design of the connector as needed to meet project requirements.

### Quick Assembly

Our connection systems typically use less and smaller bolts in comparison to ANSI or ASME flanges. Our catalog of connectors include clamps that only require four bolts and connectors that are self aligning.

### Cost Savings

In many cases, our connector assemblies are less expensive to purchase than the corresponding ANSI or ASME flange assembly. Our leak-free seal rings save operational costs.

### High Pressure/Temperature

Our connector systems have applications in high pressure and/or high temperature where they outperform ANSI and ASME flanges in terms of reliability and leak free service.

## Connector Applications

M-LOK® simplicity sealing efficiency, and economy our M-LOK® connector benefits a wide range of industries in various applications:

### Aerospace —

Rocket test stands, fuel lines, hydraulic and pneumatic piping systems.

### Coal gasification and liquefaction

Consisting primarily of carbon monoxide, hydrogen, carbon dioxide, methane, and water vapour from coal and water, air and/or oxygen.

### Environmental —

Hazard waste disposal and fugitive emissions containment, and valve ends.

### Industrial gas manufacturing —

Strip Mining, Power Generation, Oil Sands Mining and Process Piping.

### Food Processing—

Sanitary/general piping connectors, vessel closures.

### Fossil and nuclear power generation —

Feedwater piping, steam piping, boiler and turbine and nuclear reactor.

### Marine & Ship building & maintenance

General piping, boilers, pressure vessels, tanks, engines, turbine.

### Oil and Gas Production —

Onshore and Refineries, offshore topside and subsea wellheads, tees and wells, manifolds, chokes, valve ends, compressors, general piping, loading risers and pipelines.

**Petrochemical Industry** — Reactor vessel nozzles, vessel closures, general piping/valve ends in petroleum refining and chemical processing plants.

### Power Industry —

General piping/valve ends, steam lines, pump inlet/outlet lines, and chemical clean out closures.

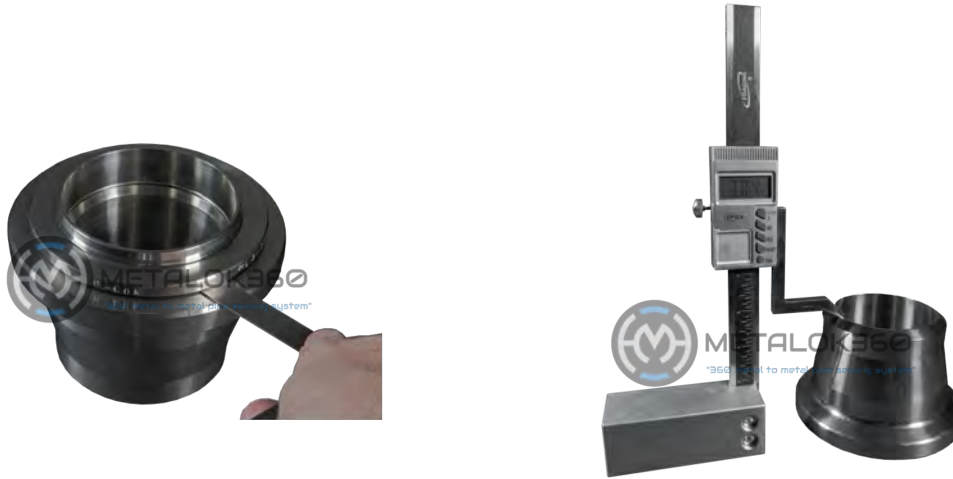
### Pulp & Paper Industry —

Chemicals, steam, utilities for pulp & paper machines which incorporates a great deal of piping and pumps.

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## M-LOK® Connection Quality Assurance, Quality Control and Testing.



### WE STAND BEHIND OUR PRODUCT

Metalok360® M-LOK™ clamp connectors are committed to offering quality products for our clients. We've built our business by offering a quality product and professional services that reflect the highest standards of our industry. Our experience team strive to maintain the highest quality standards while continuing to meet and surpass customer expectations.

M-LOK® clamp connectors Quality Assurance is a set of processes that help "avoid" defects and assure quality. While Quality Control is a set of activities that help detect defects and quality issues before our products reach the hands of end customers.

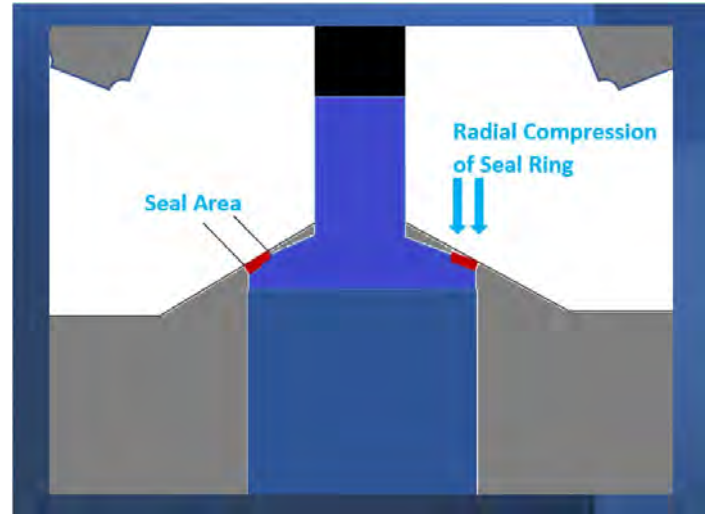
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## M-LOK® clamp connectors

- ⇒ Consists of (2) hubs, (1) seal ring, (1) clamp set with (4) bolts and (8) nuts
- ⇒ Self energized, pressure enhanced metal seal ring
- ⇒ Seal ring is designed to be reusable
- ⇒ Clamp assembly is up to 75% lighter and requires less space compared to standard flanges
- ⇒ Sizes from 1 in. to 12-in.\*
- ⇒ Pressures up to 20,000 psi\*
- ⇒ Available in all material grades
- ⇒ The M-LOK® clamp connector is interchangeable with other clamp connectors in the market
- ⇒ Lower torque requirements no need for costly and timely hydraulic tensioning equipment
- ⇒ Quick assembly / disassembly with fewer bolts & parts with no bolt holes to align

\*Special designs available

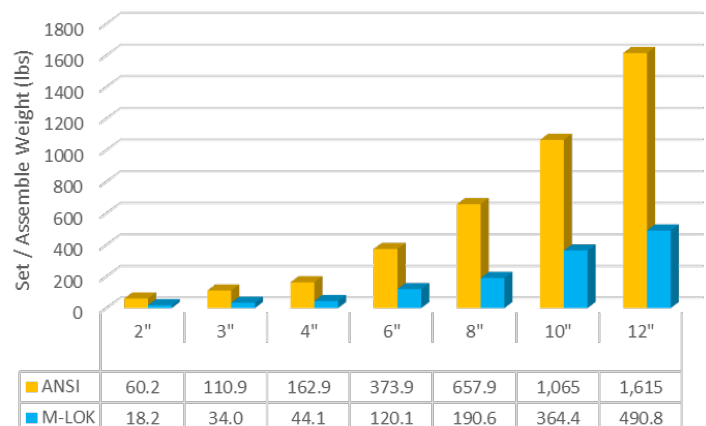


**8-in. – 1500# ANSI Class Comparison just 4 bolts to install, compared with 8-24 bolts for conventional flanges.**

M-LOK® connector is substantially smaller in size and 75% lighter in weight when compared to an equivalent ANSI or ASME flange.



M-LOK® Hubs



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# M-LOK<sup>®</sup> clamp connector vs. ANSI/ASME Flanges

## Advantages of M-LOK<sup>®</sup> clamp connector

- ⇒ Self energized and pressure enhanced seal
- ⇒ Seal ring is designed to be reusable
- ⇒ Small relative movements between hubs can be accommodated by seal ring deflection
- ⇒ Clamp assembly lighter and requires less space
- ⇒ Clamp bolts are oriented perpendicular to pressure end thrust and are not subjected to hydrostatic loading due to pressure
- ⇒ Small outside dimensions allow use in more confined and congested areas

## Disadvantages of ANSI/ASME Flanges

- ⇒ Larger and bulkier flange forging
- ⇒ Often more and larger bolts
- ⇒ Generally a crush type gasket
- ⇒ High bolt torque required to seat and maintain contact pressure
- ⇒ Costly and timely hydraulic tensioning equipment
- ⇒ Poor adaptability to changing conditions (temperature)
- ⇒ Even make-up required to avoid impingement of gasket
- ⇒ Gasket is not reusable



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